APPENDIX C
PLANNING LEVEL COST ESTIMATOR

Cost Calculator

New On-Street Facilities				
	Priority Network Miles	**Priority Network Costs**	**Total Network Miles**	**Total Network Cost (at full build-out)**
Bike lanes*	30.0	$559,000	117	$ 1,696,500
Buffered Bike Lanes*	2.3	$67,804	5.4	$ 128,304
Shared lane markings*	41.0	$255,420	72	$ 475,200
Sidepath	11.6	$2,052,540	50	$ 12,670,000
Shared use pathway	4.5	$2,483,550	237	$ 123,287,400
Bicycle boulevard	57.2	$6,223,360	124	$ 13,466,400
Paved shoulder	1.7	$936,320	51	$ 10,775,987
Study **	0	TBD	114	TBD
TOTAL	**148.3**	**$12,611,708**	**770.4**	**$ 162,499,791**

Maintenance and Replacement Costs - Priority Network			
Facility Type	**Assumptions**	**Estimated Annual Maintenance Cost**	**Estimated Average Annual Budget for Replacement**
Bicycle Route Signage - On-Street	*Cost represents annual replacement of all signs on on-street Priority Network * 10 (average number of signs per mile) at $125 per sign * 2 sides. Note: All signs will generally need to be replaced every 10 years.*	$10,230	$ 17,050
Bicycle Lanes	*Assumes paint for striping and thermoplastic for symbols. Outside striping marking generally repainted annually at $1 per linear foot and bike lane symbols replaced every 5 years $165 per symbol.*	$584,220	$ -
Buffered Bike Lanes	*Assumes paint for striping and thermoplastic for symbols. All striping markings generally repainted annually at $1 per linear foot and bike lane symbols replaced every 5 years at $165 per symbol.*	$21,556	$ -
Shared Lane Markings	*Assumes thermoplastic. All SLM symbols generally replaced every 5 years at $165 per shared lane marking*	$255,420	$ -
Sidepath (concrete)	*Assumes sweeping at $34 per mile * once per month. Typical lifecycle is 25 years at which point major patching or resurfacing will be required.*	$15,518	$ 82,115
Shared Use Path (concrete)	*Assumes sweeping at $34 per mile * once per month. Typical lifecycle is 25 years at which point major patching or resurfacing will be required.*	$8,621	$ 99,338

Bicycle boulevard	*Assumes thermoplastic shared lane markings and paint for striping. SLMs generally replaced every 3 years at $165 per marking paint restriped annually. Assumes a 25 year lifespan for the traffic calming improvements (mini-traffic circle), 25 year lifespan for the curb blubs, 25 years for the sidepath, and 20 years for the pedestrian signal.*	$171,600	$ 273,988
Paved shoulder	*Assumes no additional sweeping, landscaping, or pavement maintenance.*	$0	$ 93,632
TOTAL		**$1,067,165**	**$ 566,123**

Other Facility Costs		
Item	**Assumptions**	**Unit Cost**
Install Full Traffic Signal	*Assumes that the full cost of the traffic signal is applied as a bicycle facility improvement (no cost shared by pedestrian, transit, motor vehicle, or other budgets)*	$200,000.00
Install Pedestrian Crossing Signal	*Assumes that the full cost of the pedestrian crossing signal is applied as a bicycle facility improvement (no cost shared by pedestrian budgets)*	$90,000.00
Install Pedestrian Crossing Island	*Assumes that two 11' by 10' islands and signs will be provided at each intersection, and that the full cost of the pedestrian crossing islands will be applied as a bicycle improvement (no cost shared by pedestrian budgets)*	$40,000.00
Upgrade Existing Pedestrian Crossing Signal to Accommodate Bicycles	*Assumes 4 special-order bicycle traffic signal heads will be needed at the intersection. Assumes no other hardware or software upgrades, but such upgrades may be necessary.*	$12,000.00
Signs	*The number of signs installed per mile along a bicycle route will vary depending intersection density, number of intersecting routes, parking restrictions and other factors.*	$125.00
Bike Racks	*Assumes standard inverted U rack and includes installation.*	$400.00
Calibrate bicycle detection at traffic signals (on-street facilities)	*Assumes four approaches per intersection calibrated at man-hour per approach, $100 per man hour*	$400.00

** Cost calculation assumes no on-street parking lane stripe. Costs will be slightly higher where there is a striped parking lane.*

*** Streets where design solution not immediately apparent.*

Disclaimer

*These costs are intended to be general and used for long-range planning purposes. The construction estimates **do not** include costs for planning, surveying, engineering design, right-of-way acquisition, mobilization, maintenance of traffic during construction, landscaping/aesthetics, utility adjustments, lighting, drainage, storm water management, erosion and sediment control, significant grading, bridges, retaining walls, significant changes in vehicular traffic patterns, or contingency costs. Maintenance costs are based on estimates from a variety of sources including the City of Wichita. Construction costs will vary based on the ultimate project scope (i.e. combination with other projects) and economic conditions at the time of construction.*

Unit costs per mile assume only those markings that would not otherwise be present on the roadway, e.g. bike lane and shared lane marking symbols and additional striping. Maintenance costs are averaged over a 10 year period (the projected timeframe for full build-out of the Priority network), and therefore nearer-term costs are over estimated, and annual maintenance cost at year 10 are under estimated. Sign replacement costs are not included in facility-specific cost estimates (see above for sign replacement cost assumptions)

Cost Assumptions and Calculations

	Facility Unit Cost (per mile)	Calculation	Assumptions
On-Street Facilities			
Bike Lanes			
Add bike lanes (with parking)	$27,700.00	Facility Unit Cost = $1/LF * 5280 feet * 2 lines * 2 sides + $165 per bike symbol * 20 symbols/mile*$165 * 2 sides	Assumes 2 bicycle lane lines and 20 bike and arrow symbols per mile are added on each side of the roadway to create the bicycle lane. $165 per bike and arrow symbol includes the material (thermoplastic) and installation costs.
Add buffered bike lane (with parking)	$40,040.00	Facility Unit Cost = (3 lines*5280*$1/LF * 2 sides)+(880 LF diagonal lines*2*$1/LF)+(20 symbols/mile*$165 * 2 sides)	Assumes a 30" diagonal stripe every 15 feet between two continuous parallel lines both sides of street plus inside bike lane/parking lane stripe, 20 bike and arrow symbols per mile both sides. $165 per bike and arrow symbol includes the material (thermoplastic) and installation costs.
Add bike lanes (no parking)	$17,200.00	Facility Unit Cost = $1/LF * 5280 feet * 1 line * 2 sides + 20 symbols/mile*$165 * 2	Assumes 2 bicycle lane lines and 20 bike and arrow symbols per mile are added on each side of the roadway to create the bicycle lane. $165 per bike and arrow symbol includes the material

		sides	(thermoplastic) and installation costs.
Add buffered bike lane (no parking)	$29,480.00	Facility Unit Cost = (2 lines*5280*$1* 2 sides)+(880 LF diagonal lines*2*$1)+(20 symbols/mile*$165 * 2 sides)	Assumes a 30" diagonal stripe every 15 feet between two continuous parallel lines sides of street, 20 bikes and arrow symbols per mile both sides. $165 per bike and arrow symbol includes the material (thermoplastic) and installation costs.
Pavement restoration for bike lanes			This is an add-on expense for those roadways where pavement needs to be restored in order to provide a high quality bike lane facility.
Shared Lane Markings			
Add shared lane markings (no parking)	$6,600.00	Facility Unit Cost = $165 per shared lane marking symbol * 20 symbols/mile * 2 sides	Assumes 20 shared lane marking symbols per mile are added on each side of the roadway to create the shared lane pavement marking facility. $165 per bike and arrow symbol includes the material (thermoplastic) and installation costs.
Add shared lane markings (with parking)	$17,200.00	Facility Unit Cost = $1/LF*5280 feet*2 lines + $165 per shared lane marking symbol *20 symbols/mile * 2 sides	Assumes parking lane lines added to both sides of street and 20 shared lane marking symbols per mile are added on each side of the roadway to create the shared lane pavement marking facility. $165 per bike and arrow symbol includes the material (thermoplastic) and installation costs.
Off-road Facilities			
Sidepath (new)	$253,400.00	Facility Unit Cost = 12 ft wide path * 5,280 (63,360 square feet) * $4/SF for excavation, base course and concrete	Assumes excavation, base aggregate, and concrete for 12 ft wide, 5" thick sidepath, one side of street. Total project costs may include the following additional costs as percentage of construction cost: 5% landscaping; 20% Drainage and Engineering Surveying; 5% Maintenance of traffic; 5% Utility Adjustments. Does not take into account breaks in the facility, e.g. driveways and intersections, and therefore, costs may overestimated.
Shared Use Path (new)	$551,900.00	Facility Unit Cost = 12 ft wide path * 5,280 (63,360 square feet) * $5/SF for excavation, base course and concrete + 1/2 pedestrian signal (one for every 2 miles of facility) * $90,000 each + $ 3/SF for	Assumes a new 5" thick concrete shared use pathway in existing independent right-of-way (i.e. acquisition costs not included) built to roadway standards. Total project costs may also include the following additional costs as percentage of construction cost: E&S; 5% Maintenance of traffic;

		landscaping; drainage; utility adjustments	
Bicycle Boulevard (assumes 8 blocks per mile)			
	$108,800.00	Facility Unit Cost: 6 curb bulbs*$7,000 each + 1 mini traffic circle * $8,000 each + 16 intersections*50 LF of striping*$1/LF + 32 shared lane markings at $125 each + 24 sign assemblies at $125 each + 1/2 (1 pedestrian signal for every 2 miles of facility * $90,000) + 12 ft sidepath * 100ft length * $4/ SF	Assumes the installation of curb extensions without drainage impacts, centerline strip (paint) for the first 50 feet of each residential street intersection, assumes the use of shared lane markings (thermoplastic) with 4 markings per block and 4 sign assemblies per block, one pedestrian signal for every 2 miles of facility, 1 min-traffic circle for traffic calming (average - some streets will need more, others less), and minimum 100' of sidepath (connecting intersection to crosswalk) per side. Other costs may include 5% for landscaping, 10% for drainage, 5% for traffic control and 10% for utility adjustments.
Paved Shoulder			
	$164,266.67	Facility Unit Cost = 5280 ft * $1.11/ SF + 4 ft width * 5280 ft * $6.66/SF	Assumes 4 ft paved shoulder comprised of 8" crushed rock at $10 SY and 7" asphalt at $60 SY. Other costs may include 5% for landscaping, 10% for drainage and E&S, 5% for traffic maintenance, 10% for utility adjustment, 25% contingency and no parking signs.
Bike Route Signing			
	$2,500.00	Facility Unit Cost = $125 per sign assembly*10*2 sides	Spacing of bike signs is flexible based on Engineering judgment & current practices. This calculation assumes up to 10 bike route/wayfinding signs per mile installed on both sides of bicycle route. In some cases the number of signs per mile may be more or less than 10. Unit cost includes one sign, post and installation. Some wayfinding sign assemblies may have more than one sign, and therefore would be higher cost.
Per Mile Annual Maintenance Cost Estimates for On-road Facilities			

Shared Lane Markings	$6,600.00	Facility Unit Cost = $165 per shared lane marking * 20 shared lane markings per mile * 2 sides	Assumes thermoplastic. All SLM symbols generally replaced every 5 years at $165 per shared lane marking
Bicycle Lanes	$17,976.00	Facility Unit Cost = $1 per linear foot * 5280 feet * 1 line * 2 sides + $165 per bike and arrow * 20 bike and arrow per mile * 2 sides + sweeping at $34 per mile * 2 sides * 12 months per year	Assumes paint for striping and thermoplastic for symbols. Outside striping marking generally repainted annually at $1 per linear foot and bike lane symbols replaced every 5 years $165 per symbol.
Buffered Bike Lane	$9,372.00	Facility Unit Cost = 2 lines*5280*$1* 2 sides)+(880 LF diagonal lines*2*$0.75)+(20 bike and arrow per mile* 2 sides*$165) + sweeping at $34 per mile * 2 sides * 12 months per year	Assumes paint for striping and thermoplastic for symbols. All striping markings generally repainted annually at $1 per linear foot and bike lane symbols replaced every 5 years at $165 per symbol.
Bicycle Boulevard	$3,000.00	Facility Unit Cost = 40 shared lane markings * $165 + $1 per linear foot*800 feet	Assumes thermoplastic shared lane markings and paint for striping. SLMs generally replaced every 3 years at $165 per marking paint restriped annually. Assumes a 25 year lifespan for the traffic calming improvements (mini-traffic circle), 25 year lifespan for the curb blubs, 25 years for the sidepath, and 20 years for the pedestrian signal.
Spot Improvements (5 per year)	$75,000.00	TBD	Assumes 5 spot improvements per year at an average cost of $15,000. Spot improvements may range in scope and scale.
Bike Route Signing - On-Street	$75.00	Facility Unit Cost = $125 per sign assembly*10*2 sides *0.01	Assumes replacement of 1 percent of the signs per year
Paved Shoulder (asphalt)	$0.00		Assumes no additional sweeping, landscaping, or pavement maintenance.
Per Mile Annual Maintenance Cost Calculations for Off-road Facilities			
Shared-use Path	$1,575.80	Facility Unit Cost = $157.58 sweeping per mile * 10 times	Assumes sweeping at $34 per mile * once per month. Typical lifecycle is 25 years at which point major patching or resurfacing will

		per year	be required.
Sidepath	$1,915.80	Facility Unit Cost = $157.58 sweeping per mile * 10 times per year	Assumes sweeping at $34 per mile * once per month, and landscaping maintenance at $157 per mile * once per month, 10 months annually. Typical lifecycle is 25 years at which point major patching or resurfacing will be required.
Per Mile Annual Replacement Budget Calculations for Bicycle Facilities			
Shared Lane Markings	$0.00		
Bicycle Lane	$0.00		
Buffered Bicycle Lane	$0.00		
Bicycle Boulevard	$4,790.00	Facility Unit Cost = (6 curb bulbs*$7,000 each) + (1 mini traffic circle * $8,000 each)+(12 ft sidepath * 100ft length * $4/ SF) / 25 year life span) + (24 sign assemblies at $125 each / 10 year lifespan) + (1/2 of 1 pedestrian signal for every 2 miles of facility * $90,000 / 20 year lifespan	Assumes a 25 year lifespan for the traffic calming improvements (mini-traffic circle), 25 year lifespan for the curb blubs, 25 years for the sidepath, and 20 years for the pedestrian signal
Sidepath (concrete)	$10,137.60	Facility Unit Cost = (12 ft wide path * 5,280 (63,360 square feet) * $4/SF for excavation, base course and concrete) / 25 year lifespan	
Shared-use Path (concrete)	$22,075.20	Facility Unit Cost = (12 ft wide path * 5,280 (63,360 square feet) * $5/SF for excavation, base course and concrete + 1/2 pedestrian signal (one for every 2 miles of facility) * $90,000 each + $ 3/SF for landscaping; drainage; utility adjustments) / 25 year	

		lifespan	
Paved Shoulder (asphalt)	$16,426.67	Facility Unit Cost = (5280 ft * $1.11/ SF + 4 ft width * 5280 ft * $6.66/SF) / 10 year lifespan	

Global Assumptions

1) *Cost calculations assume that bicycle facility improvements are made on both sides of the street with the exception of shared use paths and sidepaths. Assumes any pavement costs are independent of bicycle facility.*
2) *Cost estimates do not include design unless specifically stated in assumptions. Design costs, which include construction planning, public process, facility design, and other background work required to implement the project, can generally be estimated at 15% to 20% of the facility construction cost. Projects requiring a higher level of public process may have higher design costs.*
3) *Cost estimates involving major construction do not include contingency costs, which typically are estimated at 15 to 25% of the construction costs.*
4) *Other costs where applicable include landscaping 5%, Drainage 10% (unless otherwise noted), Traffic control 5% and Utility adjustments 10%.*
5) *Paint markings to be restriped annually. Thermoplastic may last 3 to 5 years, depending on placement in roadway.*